THE

Maryland Agricultural College

QUARTERLY

ENTERED AT COLLEGE PARK (MD.) POST OFFICE AS SECOND-CLASS MATTER

No. 62. NOVEMBER 1913

FEED STUFF ANALYSES

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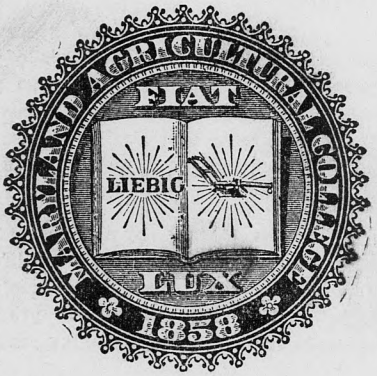

Published for the Benefit of Agriculture, and Sent Free to Anyone Desiring a Copy

Issued in the Months of February, May, August and November

ADDRESS

Chemical Department, Maryland Agricultural College

COLLEGE PARK, MD.

ANALYSES OF

Feeds Sold in Maryland

BY THE CHEMICAL DEPARTMENT OF

The Maryland Agricultural College

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This bulletin contains the results of analysis of samples feeding stuffs obtained during the year 1913. The work has been mostly limited to "concentrated feeding stuffs," as defined in the feed law. The examination of wheat bran, middlings, corn meal and similar feeds has been limited, as a rule, to a microscopic examination for adulerants and have been found practically free from adulteration and are not listed herein.

The feeds herein are, as a rule, by-products from some industry, as the manufacture of oils, alcohol, whiskey, beer, breakfast foods, etc., or mixtures of several of them with some refuse molasses. The latter has some feeding value, is liked by the animal and prevents the separation of fine and heavy ingredients from the lighter bulky material of the mixture.

FEED ANALYSIS.

A complete analysis of a feed separates it into its constitutional parts, or groups of constituents having similar properties. The usual constituents are water, ash, protein, fat, fiber and nitrogen-free extract.

WATER is present in all feeds and is an important article of commerce in this way. Old grain, called "dry," will contain about 10 percent, while new grain will contain more. If the amount is over 14 or 15 percent the grain or feed is very liable to mold and ferment. Fresh fruits and vegetables, as cabbage, turnips, etc., frequently contain over 90 percent of water. The water content of feed will change on storage, the amount of change depending on the condition at the start, method of storing, temperature and

humidity of the air, etc. If the feed has been kiln-dried, as with dried brewer's or distiller's grains, molasses feed, etc., gain in weight is common. This would be indicated if the packages weigh more than the guaranteed weight and, in that case, a corresponding decrease in the percent of the other constituents should be expected. On the other hand, should the material lose moisture, a corresponding increase in the percent of the other constituents (but not in the actual amount) occurs.

The changes in moisture content are very important in connection with sampling and analysis and the proper care of samples for analysis—points which are liable to be entirely overlooked by those who have not been instructd in such matters.

ASH, as its name indicates, is the part of the feed which remains after burning. It is the mineral part, which has its origin in the minerals of the earth (soil). All other parts of the feed have their origin, either directly or indirectly, from the air.

PROTEIN, or crude protein, is the nitrogenous part, calculated from the nitrogen by multiplying it by 6.25. It includes albumens and other nitrogenous bodies not so valuable as food. Protein is essential for the formation of flesh, nerves, hair, feathers, etc., in fact nearly all tissues of the animal body, except fat, and it may serve to form fat.

FAT, or "crude fat," is the ether extract obtained by treating the dry substance with ether. In the case of grains, seeds, nuts and flesh it is nearly pure fat and oil, but with hay, grasses and coarse fodders it contains considerable amounts of wax, gum, etc. It is often a valuable constituent of feed, is the most concentrated form of energy, and serves to build fat in the animal when in excess of its immediate requirements. Large amounts of fat are not tolerated by farm animals, as a rule.

FIBER, or "crude fiber," is the fibrous, woody part, not soluble in ether, dilute acid or alkali. It is largely indigestible, but serves to give the ration proper bulk. The digestibility varies with the nature of the fiber and the kind of animal. The amount of fiber is small in flesh, cereal grains and nuts, but large in stems, stalks, hays, straws, fodders, husks, hulls, cobs, etc., and its amount, as shown by analysis, indicates the presence of such materials.

NITROGEN-FREE EXTRACT, sometimes called "carbohydrates," is obtained by finding the amounts of the constituents enumerated above and substracting this sum from 100 percent. It includes starch, sugars, pentosans, etc., which may be determined separately.

For inspection purposes it is generally sufficient to determine the amount of protein, fat and fiber, as this will indicate if the feed has been adulterated with inferior coarse material, such as hulls, straws, cobs, etc.

A table of well-known and standard feed materials with several coarse materials is given on page 11, showing the approximate average composition for comparison with the feeds shown on the market as indicated in the following table. (Pages 4-10.) The analyses are given in percentage, or pounds in a hundred.

ANALYSIS OF FEEDING STUFFS.

No.	Name of Manufacturer or Agent	Name of Feeding Stuffs	Place of Sampling	Protein.		Fat or Ether Extract.		Crude Fiber.	
				FOUND.	Guaranteed.	FOUND.	Guaranteed.	FOUND.	Guaranteed.
24782	Amer. Agr'l Chemical Co., New York, N. Y.	Beef Scrap for Poultry.	Baltimore.....	57.27	55.00	13.79	10.00	.84	3.00
24786	Ajax Milling & Feed Co., New York, N. Y.	Ajax Flakes.....	Fallston.....	29.05	30.00	12.10	11.00	10.49	14.00
24723	Allneeda Mills Co., East St. Louis, Ill.	Horse & Mule Feed.....	Wingate.....	10.35	10.00	3.41	3.50	11.59	12.00
24726	American Maize Products Co., New York, N. Y.	Cream of Corn Gluten Feed	Prices.....	23.78	22.00	2.77	2.50	7.92	8.50
24690	American Milling Co., Chicago, Ill.	Old Process Linseed Meal	Hagerstown...	33.17	32.00	7.11	6.00	8.91	11.00
24691	" " "	Sucrene Dairy Feed....	Hagerstown...	17.11	16.50	7.03	3.50	13.20	12.00
24692	" " "	Sucrene Horse & Mule Feed	Hagerstown...	12.64	10.00	4.15	3.50	12.73	15.00
24756	E. Armacost, Baltimore, Md.,	C. & O. Horse Feed....	Baltimore	10.03		4.73		5.20	
24745	Atlantic Export Co., Chicago, Ill.	Dried Brewers Grains..	Baltimore	25.36	24.00	5.14	5.00	12.50	13.00
24746	J. J. Badenoch, Chicago, Ill.	Poultry Feed.....	Baltimore	10.44	9.50	3.22	2.00	3.01	5.00
24783	" " " " "	Sunflower Developing Feed	Baltimore	10.18	10.00	2.69	2.50	2.03	5.00
24787	Fred. Bauernschmidt, Baltimore, Md.	Dried Brewers Grains..	Cardiff.....	25.18	26.00	6.37	5.00	14 73	
24732	Baugh & Sons Co., Baltimore, Md.	Meat Meal for Poultry..	Baltimore	51.45	50.00	12.19	10.00	.80	1.00
24779	" " " " "	Special Ground Bone for Poultry	Baltimore	27.08	27.00	1.74	3.00	.90	1.00

24740	Berg Co., Philadelphia Pa.	Three Medal Poultry Meal	Annapolis	48.65	50.00	11.69	13.00	1.27	1.00
24717	J. W. Biles Co., Cincinnati, Ohio	Ready Dairy Ration....	Wash. Grove..	23.60	24.00	7.71	9.00	9.53	9.00
24677	Blatchford Calf Meal Factory, Waukegan, Ill.	Calf Meal.....	Baltimore	24.13	25.00	5.10	5.00	11.45	5.00
24670	J. Bolgiano & Son, Baltimore, Md.	Square Deal Beef Scraps	Baltimore.....	62.36	50.00	13.63	12.00	.93	1.00
24685	" " " " "	Square Deal Chick Starter	Baltimore	10.71	10.05	.95	3.57	3.23	2.70
24683	" " " " "	Square Deal Pigeon Food	Baltimore	12.57	12.55	1.35	3.47	3.95	2.76
24671	" " " " "	Square Deal Poultry Food	Baltimore	10.44	11.50	3.23	3.87	3.03	2.70
24728	F. W. Brode & Co., Memphis, Tenn.	Owl Brand Pure Cotton Seed Meal	Taneytown	41.68	41.00	8.00	6.00	7.36	10.00
24747	W. J. Byrnes & Co., Chicago, Ill.	Royal Poultry Feed.....	Baltimore	10.27	10.00	3 25	3.00	2.62	5.00
24776	Clover Leaf Milling Co., Buffalo, N. Y.	Dairy Feed.....	Sparks	12.55	16.50	4.12	3.50	11.72	12.00
24693	Corby Co., Washington, D. C.	Brewers Grains.....	Frederick.....	21.94	20.00	8.02	7.00	16.29	
24680	Corno Mills Co., St. Louis, Mo.	Hen Feed	Baltimore	10.71	10.00	3.23	3.50	2.02	5 00
24694	Corn Products Refining Co., New York, N. Y.	Buffalo Gluten Feed....	Hagerstown...	24.83	23.00	3.02	2.00	6.62	8.00
24695	" " " "	Diamond Hog Meal.....	Hagerstown...	19.22	18.00	7.60	8.00	11.53	13.00
24791	Cyphers Incubator Co., Buffalo, N. Y.	Developing Food.....	Baltimore	10.09	10.00	2.69	3.00	1.54	3.20
24686	S. P. Davis, Little Rock, Ark.	Good Luck Brand Cotton Meal	Baltimore	40.37	41.00	7.68	7.00	10.55	
24743	L. E. P. Dennis & Son, Crisfield, Md.	Poultry Compound.....	Crisfield.....	40.02		5.40		5.74	
24788	Dewey Bros. Co., Blanchester, Ohio	Distillers Dried Three Grains	Cardiff	24.92	26.00	9.84	9.00	8.93	8.00
24784	Albert Dickinson, Co., Chicago, Ill.	Globe Egg Mash	Baltimore	16.94	16.00	3.51	3.00	7.54	10.00
24753	Douglass & Co., Cedar Rapids, Iowa	Buffalo Gluten Feed....	St. Michaels...	22.73	20.00	3.02	2.00	6.00	8.00

ANALYSIS OF FEEDING STUFFS.

No.	Name of Manufacturer or Agent	Name of Feeding Stuffs.	Place of Sampling.	Protein.		Fat or Ether Extract.		Crude Fiber.	
				FOUND.	Guaranteed.	FOUND	Guaranteed.	FOUND.	Guaranteed.
24721	Dubois Brewing Co., Dubois, Pa.	Brewers Dried Grains..	Woodbine	30.19	23.00	6.16	6.00	13.34	20.00
24722	John F. Eby & Son, Lancaster, Pa.	Laymore Hen Feed.....	Hampstead....	9.21	7.00	1.12	2.00	1.95	7.00
24754	John W. Eshelman, Lancaster, Pa.	Hen Feed	Baltimore	10.18	9.00	1.67	3.00	2.21	3.00
24724	Frey & Son, Baltimore, Md.	Prize Brand Hen Feed..	Madison.....	9.65	7.00	3.40	2.00	2.09	7 00
24734	J. M. Frisch & Co., Baltimore, Md.	Dried Brewers Grains..	Annapolis	26.41	25.00	6.15	6.00	13.61	13.00
24672	" " " " " "	Prime Cotton Seed Meal	Baltimore	38.08	38.50	6.83	6.00	7.30	9.00
24748	" " " " " "	Pure Old Proc. Oil Meal.	Baltimore	31.59	30.00	6 78	5.00	8.80	5.00
24719	C. A. Gambrill Mfg. Co, Baltimore, Md.	Patapsco Horse Feed...	Cambridge	9.04	11.75	3.89	4.60	4.26	7.50
24777	T. A. Snyder Green Ridge Mills, Brodbeck. Pa.	Blue Ribbon Hen Feed..	Hampstead...	9.21	8.00	2.64	2.00	2.23	5.00
24790	Bryan Haywood, Kansas City, Mo.	Henfalva.....	Baltimore	11.58	13.00	1.62	1.00	34.07	25.00
24755	Hen-E-La Bone Co., Newark, N. J.	Hen-O-La Dry Mash....	Baltimore	11.76	12.00	2.88	2.00	3.61	3.00
24741	Hoge & McDowell Co., Washington, D. C.	Columbia Hen Mash....	Riverdale.....	18.52		4.81		8.43	
24684	Humphreys Godwin Co., Memphis, Tenn.	Cotton Seed Meal.....	Westminster ..	40.72	41.00	6.83		9.50	
24669	" " "	Dixie Brand Cotton Seed Meal	Westminster ..	38.08	38.62	7.05	6.00	10.97	8.00

24778	" " "	"Forfat" Brand Cotton Seed Meal	Westminster..	39.14	38.62	7.86	6.00	9.69	8.00
24749	International Sugar Feed Co., Minneapolis, Minn.	Special Molasses Feed..	Baltimore.....	14.39	12.50	4.92	3.50	11.57	12.00
24792	L. Kellum & Co., Baltimore, Md.	Poultry Feed.....	Baltimore.....	12.02		4.56		4 06	
24696	Chas. A. Krause Milling Co., Milwaukee, Wis.	Badger Dairy Feed.....	Walkersville...	15.80	16.00	5.49	2.00	13.63	15.00
24681	Larrowe Milling Co., Detroit, Mich.	Dried Beet Pulp.....	Baltimore.....	8.60	8.00	.75	.50	19.41	20.00
24729	" " "	Larro Feed.....	New Windsor..	19.13	19.00	4.19	3 00	12.47	14.00
24735	Marion Harper Cotton Oil Co., East Pt., Ga.	Cotton Seed Meal.....	Annapolis.....	37.73	38.62	7 12	6.00	11.17	8.00
24697	Mann Bros. Co., Buffalo, N. Y.	Pure Linseed Oil Meal..	Hagerstown...	34.31	34.00	7.51	6.00	7.81	5.00
24678	D. B. Martin Co., Philadelphia, Pa.	Meat Meal or Scraps...	Baltimore.....	49.96		11.00		1.15	
24757	W. J. Massey, Price, Md.	Unique Cow Feed.....	Massey.....	15.80		5.40		5.82	
24733	Midland Linseed Products Co., Minneapolis, Minn.	Old Process Ground Linseed Cake	Baltimore.....	33.43	32.00	6.47	6.00	8.43	8.50
24801	Milwaukee Grain & Feed Co., Milwaukee, Wis.	Crown Brewers Dried... Grains	Baltimore.....	29.40	25.00	6.62	5.00	12.16	15.00
24682	Monticello Distilling Co., Baltimore, Md.	Muller Dried Rye Grains	Baltimore.....	15.45	16.00	8.90	12.00	13.98	14.00
24785	Joel Moores & Co., Baltimore, Md.	Ground Beef, Cracklings for Poultry Food	Baltimore.....	64.15	50.00	10.30	12.00	.80	
24800	National Oats Co., St. Louis, Mo.	Molasco.....	Baltimore.....	8.34	10.00	3.41	3.25	11.22	12.00
24744	" " " " "	Nutro Hen Feed.....	Baltimore.....	10.18	10.00	1.10	3.50	2.00	5.00
24759	New Oxford Pure Feed Co., New Oxford, Pa.	Ox-O Pure Cane Molasses Dairy Feed No. 1	New Oxford...	23.12	25.00	5.78	3.50	10.89	11.00
24758	" " " " "	Ox-O Pure Cane Mol. Conc. Prot. Dairy Feed	New Oxford...	26.18		5.25		9.75	
24760	" " " " "	Ox-O Pure Cane Molasses Dairy Feed No. 2..	New Oxford...	19.34		4.80		14.15	
24761	" " " " "	Ox-O Pure Cane Mol. Horse & Mule Feed	New Oxford...	17.89		4.85		10.03	

ANALYSIS OF FEEDING STUFFS.

No.	Name of Mannfacturer or Agent.	Name of Feeding Stuffs.	Place of Sampling.	Protein.		Fat or Ether Extract.		Crude Fiber.	
				FOUND.	Guaranteed.	FOUND.	Guaranteed.	FOUND.	Guaranteed.
24762	New Oxford Pure Feed Co., New Oxford, Pa.	Ox-o Pure Cane Molasses Swine Feed.....	New Oxford...	20.14		4 45		6.88	
24763	" " " " "	Pure Dry Mash Poultry Feed	New Oxford...	23.87		6.40		7.02	
24687	North Carolina Cotton Oil Co., Henderson, N. C.	Cotton Seed Meal.....	Baltimore	38.26	38.62	6.88	4.00	11.19	10.00
24736	Northern Illinois Cereal Co., Lockport, Ill.	Gold Meal Poultry Food	Baltimore	9.56	10.00	2.55	3.00	2.09	5.00
24713	Northern Linseed Oil Co., Minneapolis, Minn.	Ground Oil Cake.....	Pocomoke City	34.75	32.00	5.38	6.00	7.17	9.00
24698	North-West Mills Co., Winona, Minn.	Sugarota Dairy Feed...	Walkersville...	16.06	16.50	5.46	3.50	10.85	14.00
24793	G. Ober & Sons Co., Baltimore, Md.	Royal Crown Beef Meal for Poultry	Baltimore	62.82	50.00	9.77	12.00	.52	1.00
24739	Omaha Alfalfa Milling Co., Omaha, Neb.	Green Meadow Dairy Feed	Baltimore	12.29	11.00	.92	1.00	6.32	2.00
24716	" " " "	Perfection Horse Feed..	Baltimore	11.14	10.50	3.34	2.00	9.04	12.00
24699	Park & Pollard Co., Boston, Mass.	Dry Mash Feed.....	Hagerstown...	18.52	18.00	3.16	3.50	4.64	12.00
24794	" " " " "	Growing Feed.....	Baltimore	13.69	10.00	3.67	3.50	4 04	8.00
24781	Patapsco Guano Co., Baltimore, Md.	Beef Scrap for Poultry.	Baltimore	57.64	55.00	13.20	10.00	1.68	3.00
24714	M. C. Peters Mill. Co., Omaha, Neb.	Arab Horse Feed.....	Pocomoke City	10.62	9.00	3.53	2.00	9.88	15.00

24789	Pioneer Cereal Co., Akron, Ohio	Corn & Oat Chop	Perryman	8.78	10.00	4.38	4.00	7.76	10 00
24700	" " " "	Stock Feed.....	Hagerstown.	10.44	10.00	4.94	3.50	5.78	9.00
24701	Quaker Oats Co., Chicago, Ill.	Blue Ribbon Dairy Feed	Woodsboro	22.46	25.00	5.10	4.00	10.09	9.00
24702	" " " "	Boss Feed.....	Adamstown....	8.16	8.00	4.27	3.00	10.91	12.00
24703	" " " "	Dairy Feed.....	Hagerstown...	15.36	16.00	3.73	3.50	13.85	14.00
24704	" " " "	Schumacher Calf Meal..	Frederick.....	17.55	19.00	7.55	8 00	4 35	3.00
24705	" " " "	Schumacher Stock Feed	Woodsboro	10.79	10.00	3.60	3.25	9.40	10.00
24799	Ralston Purina Co., St. Louis, Mo.	Chicken Chowder Feed	Baltimore	19.48	17.00	4.69	3.00	7.16	
24766	" " " "	Dairy Feed.....	Baltimore	17.11		3.88		16.00	
24706	" " " "	Molasses Feed.....	Hagerstown...	9.39	10.00	3.79	2.50	10 11	12.00
24730	Reindollar Bros. & Co., Taneytown, Md.	Rein-o-la Poultry Mash.	Taneytown	10.53	12.00	2.32	3.00	2.54	4.00
24731	" " " "	Rein-o-la Scratch Feed.	Taneytown	9.13	9.00	2.80	2.00	2.43	3.00
24770	Wm. G. Scarlett & Co., Baltimore, Md.	Oriole Beef Scraps.....	Brinklow	46.19	50.00	15.18	12.00	.75	
24673	" " " "	Oriole Brand H. G. Beef Scraps	Baltimore	60.63	55.00	13.30	14.00	.63	3.00
24710	" " " "	Oriole Brand H. G. Dry Mash	Baltimore	20.36	16.50	5.53	4.00	9.75	9.60
24767	" " " "	Oriole Brand H. G. Poultry Feed.....	Baltimore	10 04	11.00	3.19	3.70	2.76	4.00
24676	C. S. Schermerhorn & Son, Baltimore, Md.	Cotton Seed Meal..,...	Baltimore	37.73		8.25		11.72	
24798	" " " "	Dried Beef Scrap.....	Baltimore	58.71	50.00	12.61	12.00	.73	1.00
24679	" " " "	Flax Seed Meal.....	Baltimore	32.12		8 38		7.80	
24751	" " " "	Old Process Oil Meal...	Baltimore	29.66	31 50	6.49	7.00	9.31	10.00
24738	Schlitz Brewing Co., Milwaukee, Wis.	Purity Dried Grains....	Annapolis	27.12	24.00	6 19	6.00	13.79	16.00
24675	W. A. Simpson & Co., Baltimore, Md.	Champion Brand Meat Meal	Baltimore	40.63	40.00	12.20	10.00	1.00	
24795	Southern Cotton Co., Savannah, Ga.	Standard Grade Cotton Seed Meal	Baltimore	39.14		7.94		8.98	
24674	Southern Cotton Oil Co., Charlotte, N. C.	Bonita Brand Cotton Seed Meal	Baltimore	37.73	38.62	6.88	6.00	11.50	10.00

ANALYSIS OF FEEDING STUFFS.

No.	Name of Manufacturer or Agent.	Name of Feeding Stuffs.	Place of Sampling.	Protein.		Fat or Ether Extract.		Crude Fiber.	
				FOUND.	Guaranteed.	FOUND.	Guaranteed.	FOUND.	Guaranteed.
24752	John Strohner, Baltimore, Md.	Poultry Feed.....	Baltimore	10.03		1.73		2.45	
24707	W. Newton Smith, Baltimore, Md.	Cotton Seed Meal.....	Frederick	37.38	41.00	8.17	7.00	12.71	9.00
24796	Swift & Co., Newark, N. J.	Digester Tankage	Baltimore	48.53	60.00	14.87		2.90	
24764	" " " " "	Special Meat Scrap	Cumberland ...	44.28	50.00	14.34	8 00	2.09	3.00
24725	Thomas & Co., Frederick, Md.	Dairy Feed.....	Barnesville....	17.20	16.50	4.94	3.50	11.20	14.00
24709	Phillip Thompson Co., Wilmington, Del.	Prime Cotton Seed Meal	Berlin.....	38.08	43.00	8.68	9.00	9.49	
24720	Toledo Seed & Oil Co., Toledo, Ohio	Old Process Oil Meal ...	Cambridge ...	30.63	30.00	6.61	5.00	8.99	2.00
24765	Ubiko Milling Co., Cincinnati, Ohio	Dairy Feed.....	Rockville.....	22.73	24.00	6.30	7.00	9.97	9.00
24780	" " "	Union Grains Biles Ready Dairy Ration ..	Rockville.....	23.04	24.00	7.39	7.00	9.85	9.00
24712	United States Sugar Feed Co., Milwaukee, Wis.	Sugar Feed.....	Frederick.....	15.18	13.00	6.88	3.00	10.71	12.00
24797	Van Iderstine Co., Long Island City N. Y.	Darling's H. G. Protein Meat Scraps for Poul.	Baltimore	55.19	55.00	13.32	5.00	.62	3.00
24750	" " " "	Darling's Raw B. Meal..	Baltimore	23.87	20.00	1.31	3.00	99	
24715	R. C. Wells & Co., Baltimore, Md.	Cotton Seed Meal.....	Salisbury	38.08	38 62	7.04	4.00	10.34	10.00
24708	Western Grain Products Co., Hammond, Ind.	Hammond Dairy Feed ..	Frederick.....	17.38	16.50	6.77	3.50	12.44	
24775	Wilkins & Jordan, Silver Springs, Md.	O. P. Linseed Meal.....	Brinklow.....	30.98		8.09		8.95	
24711	R. A. Wooldridge Co., Baltimore, Md.	Beef Scrap for Poultry.	Baltimore	57.23	59.00	13.84	10.00	1.38	3.00

Table II. Showing approximate average percent (pounds per hundred) of protein, fat and fiber in familiar substances.

	Protein.	Fat.	Fiber.
Meat Meal	70	12	1
Dried Blood	80	3	0
Cotton Seed Meal	40	8	7
Linseed Meal	35	7	9
Gluten Meal	32	6	2
Gluten Feed	25	3	7
Gem Oil Feed	24	9	7
Malt Sprouts	23	2	11
Dried Distillers' Grains (Corn)	30	11	11
Dried Distillers' Grains (Rye)	20	6	12
Dried Brewers' Grains	20	6	11
Wheat Middlings	17	5	5
Wheat Bran	15	4	8
Corn Bran	8	6	13
Corn Cobs	2+	0.5	30
Corn	10	5	2
Oats	12	5	10—
Wheat	12	2	2—
Barley	12	2	3
Buckwheat	10	2	9—
Cow Peas	21	1+	4
Timothy Hay	6	2.5	29
Clover Hay	12	3	25
Alfalfa	14	2	25
Cotton Seed Hulls	4	2	47
Oat Straw	4	2	37
Wheat Straw	3	1+	38
Cabbage	2+	0.4	1½
Turnips	1	0.2	1
Pumpkins	1+	0.4	2

...THE...

MARYLAND AGRICULTURAL COLLEGE

COLLEGE PARK, MARYLAND

Winter Term Begins January 6, 1914

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Professional Degree of B. S.

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